



General

Guideline Title

Management of patients with ulcer bleeding.

Bibliographic Source(s)

Laine L, Jensen DM. Management of patients with ulcer bleeding. Am J Gastroenterol. 2012 Mar;107(3):345-60. [133 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

The definitions for quality of evidence (high, moderate, low, and very low) and strength of recommendations (strong or conditional) are provided at the end of the "Major Recommendations" field.

Initial Assessment and Risk Stratification

1. Hemodynamic status should be assessed immediately upon presentation and resuscitative measures begun as needed (Strong recommendation, low-quality evidence).
2. Blood transfusions should target hemoglobin ≥ 7 g/dl, with higher hemoglobins targeted in patients with clinical evidence of intravascular volume depletion or comorbidities such as coronary artery disease (Conditional recommendation, low-to-moderate-quality evidence).
3. Risk assessment should be performed to stratify patients into higher and lower risk categories, and may assist in initial decisions such as timing of endoscopy, time of discharge, and level of care (Conditional recommendation, low-quality evidence).
4. Discharge from the emergency department without inpatient endoscopy may be considered in patients with urea nitrogen <18.2 mg/dl; hemoglobin ≥ 13.0 g/dl for men (12.0 g/dl for women), systolic blood pressure ≥ 110 mm Hg; pulse <100 beats/min; and absence of melena, syncope, cardiac failure, and liver disease, as they have $<1\%$ chance of requiring intervention (Conditional recommendation, low-quality evidence).

Pre-Endoscopic Medical Therapy

Prokinetic Therapy

5. Intravenous infusion of erythromycin (250 mg ~30 min before endoscopy) should be considered to improve diagnostic yield and decrease the need for repeat endoscopy. However, erythromycin has not consistently been shown to improve clinical outcomes (Conditional recommendation, moderate-quality evidence).

Proton Pump Inhibitor Therapy

6. Pre-endoscopic intravenous proton pump inhibitor (PPI) (e.g., 80 mg bolus followed by 8 mg/h infusion) may be considered to decrease the proportion of patients who have higher risk stigmata of hemorrhage at endoscopy and who receive endoscopic therapy. However, PPIs do not improve clinical outcomes such as further bleeding, surgery, or death (Conditional recommendation, high-quality evidence).
7. If endoscopy will be delayed or cannot be performed, intravenous PPI is recommended to reduce further bleeding (Conditional recommendation, moderate-quality evidence).

Gastric Lavage

8. Nasogastric or orogastric lavage is not required in patients with upper gastrointestinal bleeding (UGIB) for diagnosis, prognosis, visualization, or therapeutic effect (Conditional recommendation, low-quality evidence).

Endoscopy for Diagnosis

Timing of Endoscopy

9. Patients with UGIB should generally undergo endoscopy within 24 h of admission, following resuscitative efforts to optimize hemodynamic parameters and other medical problems (Conditional recommendation, low-quality evidence).
10. In patients who are hemodynamically stable and without serious comorbidities endoscopy should be performed as soon as possible in a non-emergent setting to identify the substantial proportion of patients with low-risk endoscopic findings who can be safely discharged (Conditional recommendation, moderate-quality evidence).
11. In patients with higher risk clinical features (e.g., tachycardia, hypotension, bloody emesis or nasogastric aspirate in hospital) endoscopy within 12 h may be considered to potentially improve clinical outcomes (Conditional recommendation, low-quality evidence).

Endoscopic Diagnosis of Ulcer and Stigmata of Recent Hemorrhage

12. Stigmata of recent hemorrhage (SRH) should be recorded as they predict risk of further bleeding and guide management decisions. The stigmata, in descending risk of further bleeding, are active spurting, non-bleeding visible vessel, active oozing, adherent clot, flat pigmented spot, and clean base (Strong recommendation, high-quality evidence).

Endoscopic Therapy

Who Should Receive Endoscopic Therapy?

13. Endoscopic therapy should be provided to patients with active spurting or oozing bleeding or a non-bleeding visible vessel (Strong recommendation, high-quality evidence) (see Figure 1 in the original guideline document).
14. Endoscopic therapy may be considered for patients with an adherent clot resistant to vigorous irrigation. Benefit may be greater in patients with clinical features potentially associated with a higher risk of rebleeding (e.g., older age, concurrent illness, inpatient at time bleeding began) (Conditional recommendation, moderate-quality evidence).
15. Endoscopic therapy should not be provided to patients who have an ulcer with a clean base or a flat pigmented spot (Strong recommendation, high-quality evidence).

What Endoscopic Therapies Should Be Used?

16. Epinephrine therapy should not be used alone. If used, it should be combined with a second modality (Strong recommendation, high-quality evidence).
17. Thermal therapy with bipolar electrocoagulation or heater probe and injection of sclerosant (e.g., absolute alcohol) are recommended because they decrease further bleeding, need for surgery, and mortality (Strong recommendation, high-quality evidence).
18. Clips are recommended because they appear to decrease further bleeding and need for surgery. However, comparisons of clips versus other therapies yield variable results and currently used clips have not been well studied (Conditional recommendation, low-to-moderate quality evidence).
19. For the subset of patients with actively bleeding ulcers, thermal therapy or epinephrine plus a second modality may be preferred over clips or sclerosant alone to achieve initial hemostasis (Conditional recommendation, low-to-moderate-quality evidence).

Medical Therapy after Endoscopy

20. After successful endoscopic hemostasis, intravenous PPI therapy with 80 mg bolus followed by 8 mg/h continuous infusion for 72 h should be given to patients who have an ulcer with active bleeding, a non-bleeding visible vessel, or an adherent clot (Strong recommendation,

high-quality evidence) (see Figure 1 in the original guideline document).

21. Patients with ulcers that have flat pigmented spots or clean bases can receive standard PPI therapy (e.g., oral PPI once-daily) (Strong recommendation, moderate-quality evidence).

Repeat Endoscopy

22. Routine second-look endoscopy, in which repeat endoscopy is performed 24 h after initial endoscopic hemostatic therapy, is not recommended (Conditional recommendation, moderate-quality evidence).
23. Repeat endoscopy should be performed in patients with clinical evidence of recurrent bleeding and hemostatic therapy should be applied in those with higher risk stigmata of hemorrhage (Strong recommendation, high-quality evidence).
24. If further bleeding occurs after a second endoscopic therapeutic session, surgery or interventional radiology with transcatheter arterial embolization is generally employed (Conditional recommendation, low-quality evidence).

Hospitalization for Patients with UGIB

25. Patients with high-risk stigmata (active bleeding, visible vessels, clots) should generally be hospitalized for 3 days assuming no rebleeding and no other reason for hospitalization. They may be fed clear liquids soon after endoscopy (Conditional recommendation, low-quality evidence).
26. Patients with clean-based ulcers may receive a regular diet and be discharged after endoscopy assuming they are hemodynamically stable, their hemoglobin is stable, they have no other medical problems, and they have a residence where they can be observed by a responsible adult (Strong recommendation, moderate-quality evidence).

Long-Term Prevention of Recurrent Bleeding Ulcers

27. Patients with *Helicobacter pylori*-associated bleeding ulcers should receive *H. pylori* therapy. After documentation of eradication, maintenance antisecretory therapy is not needed unless the patient also requires non-steroidal anti-inflammatory drugs (NSAIDs) or antithrombotics (Strong recommendation, high-quality evidence) (see Figure 2 in the original guideline document).
28. In patients with NSAID-associated bleeding ulcers, the need for NSAIDs should be carefully assessed and NSAIDs should not be resumed if possible. In patients who must resume NSAIDs, a cyclooxygenase-2 (COX-2)-selective NSAID at the lowest effective dose plus daily PPI is recommended (Strong recommendation, high-quality evidence).
29. In patients with low-dose aspirin-associated bleeding ulcers, the need for aspirin should be assessed. If given for secondary prevention (i.e., established cardiovascular disease) then aspirin should be resumed as soon as possible after bleeding ceases in most patients: ideally within 1 to 3 days and certainly within 7 days. Long-term daily PPI therapy should also be provided. If given for primary prevention (i.e., no established cardiovascular disease), antiplatelet therapy likely should not be resumed in most patients (Conditional recommendation, moderate-quality evidence).
30. In patients with idiopathic (non-*H. pylori*, non-NSAID) ulcers, long-term antiulcer therapy (e.g., daily PPI) is recommended (Conditional recommendation, low-quality evidence).

Definitions:

Quality of Evidence Using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) System

The quality of evidence, which influences the strength of recommendation, ranges from "high" (further research is very unlikely to change the guideline authors' confidence in the estimate of effect) to "moderate" (further research is likely to have an important impact on the guideline authors' confidence in the estimate of effect and may change the estimate) to "low" (further research is very likely to have an important impact on the guideline authors' confidence in the estimate of effect and is likely to change the estimate), and "very low" (any estimate of effect is very uncertain).

Strength of Recommendations Using the GRADE System

The strength of a recommendation is graded as strong when the desirable effects of an intervention clearly outweigh the undesirable effects and is graded as conditional when uncertainty exists about the trade-offs. In addition to quality of evidence and balance between desirable and undesirable effects, other factors affecting the strength of recommendation include variability in values and preferences of patients, and whether an intervention represents a wise use of resources.

Clinical Algorithm(s)

The original guideline document contains clinical algorithms for:

- Recommended endoscopic and medical management based on stigmata of hemorrhage in ulcer base (Figure 1)
- Recommended management to prevent recurrent ulcer bleeding based on etiology of ulcer bleeding (Figure 2)

Scope

Disease/Condition(s)

Overt upper gastrointestinal bleeding (UGIB) due to gastric or duodenal ulcers

Guideline Category

Diagnosis

Evaluation

Management

Prevention

Risk Assessment

Treatment

Clinical Specialty

Emergency Medicine

Family Practice

Gastroenterology

Internal Medicine

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To provide recommendations for the step-wise management of patients with overt upper gastrointestinal bleeding (UGIB) due to gastric or duodenal ulcers

Target Population

Patients with upper gastrointestinal bleeding (UGIB) due to gastric or duodenal ulcers

Interventions and Practices Considered

Risk Assessment/Evaluation

1. Hemodynamic status assessment with resuscitation measures if required
2. Blood transfusion with targeted hemoglobin of ≥ 7 g/dl
3. Risk assessment and stratification
4. Discharge from emergency department without endoscopy if indicated by initial assessments

Management/Treatment

Pre-endoscopic Medical Therapy

1. Prokinetic therapy (intravenous infusion of erythromycin)
2. Intravenous proton pump inhibitor (PPI) therapy
3. Gastric lavage (not recommended)

Endoscopy for Diagnosis

1. Timing of endoscopy (within 12-24 h of admission)
2. Endoscopic diagnosis of ulcer and stigmata of recent hemorrhage

Endoscopic Therapy

1. Criteria for endoscopic therapy
2. Combining epinephrine therapy a second modality
3. Thermal therapy with bipolar electrocoagulation or heater probe and injection of sclerosant (e.g., absolute alcohol)
4. Clips
5. Thermal therapy or epinephrine plus a second modality

Medical Therapy after Endoscopy

1. Intravenous PPI therapy
2. Standard PPI therapy (e.g., oral PPI once-daily)

Repeat Endoscopy

1. Routine second-look endoscopy (not recommended)
2. Repeat endoscopy in patients with clinical evidence of recurrent bleeding
3. Surgery or interventional radiology with transcatheter arterial embolization (if further bleeding occurs after a second endoscopic therapeutic session)

Hospitalization

1. Hospitalization for at least 3 days in patients with high-risk stigmata
2. Criteria for discharge

Long-Term Prevention of Recurrent Bleeding Ulcers

1. *Helicobacter pylori* therapy if indicated
2. Assessment of need for non-steroidal anti-inflammatory drugs (NSAIDs) in patients with NSAID-associated bleeding ulcers
3. Use of a cyclooxygenase-2 (COX-2)-selective NSAID plus daily PPI if NSAID therapy is required
4. Assessment of need for aspirin in patients with aspirin-associated bleeding
5. Long-term antiulcer therapy (e.g., daily PPI) in patients with idiopathic (non-*H. pylori*, non-NSAID) ulcers

Major Outcomes Considered

- Predictive/prognostic value of risk assessment and diagnostic tests
- Efficacy of treatments
- Clinical outcomes (e.g., rate of rebleeding, need for blood transfusion, need for surgery, mortality)
- Need for second endoscopy

- Rate of hospital admission/readmission
- Length of hospital stay
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

A search of MEDLINE via the OVID interface using the MeSH term "gastrointestinal hemorrhage" limited to "all clinical trials" and "meta-analysis" for years 1966 – 2010 without language restriction as well as review of clinical trials and reviews known to the authors were performed for preparation of this document.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system was used to grade the quality of evidence.

The quality of evidence, which influences the strength of recommendation, ranges from "high" (further research is very unlikely to change the guideline authors' confidence in the estimate of effect) to "moderate" (further research is likely to have an important impact on the guideline authors' confidence in the estimate of effect and may change the estimate) to "low" (further research is very likely to have an important impact on the guideline authors' confidence in the estimate of effect and is likely to change the estimate), and "very low" (any estimate of effect is very uncertain).

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus (Nominal Group Technique)

Description of Methods Used to Formulate the Recommendations

Each recommendation is generated by a process known as the "nominal group technique." In this process, the authorship group first discusses the goal of the recommendation. Then each member of the group writes one or more statements that they feel best expresses the goal of the recommendation. These statements are disseminated, without attribution of author, among the authors, who then rank the statements, first, second, third, and so on. The statement with the lowest point total is deemed to best express the consensus of the group, and is endorsed.

Rating Scheme for the Strength of the Recommendations

The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system was used to grade the strength of recommendations.

The strength of a recommendation is graded as strong when the desirable effects of an intervention clearly outweigh the undesirable effects and is graded as conditional when uncertainty exists about the trade-offs. In addition to quality of evidence and balance between desirable and undesirable effects, other factors affecting the strength of recommendation include variability in values and preferences of patients, and whether an intervention represents a wise use of resources.

Cost Analysis

Endoscopy for Diagnosis — Timing of Endoscopy

Low-risk patients. A randomized trial compared endoscopy within 2 h versus endoscopy within 48 h in 110 patients who were hemodynamically stable, had no serious comorbidity, and had no reason to suspect variceal bleeding. No significant improvements in end points such as bleeding, surgery, or mortality were identified. However, the length of hospital stay, post-discharge unplanned physician visits, and costs were significantly decreased in the early endoscopy group. Forty-six percent of patients in the early endoscopy group could be discharged home immediately and had no rebleeding or repeat endoscopy during the next month.

In a second randomized trial comparing early endoscopy within 6 h versus within 48 h in 93 patients with hemodynamic stabilization and absence of severe comorbidity, no significant benefits were seen in clinical end points or in resource utilization. Although discharge without hospitalization was recommended in the 40% of early endoscopy patients who met criteria for early discharge, this advice was followed in only 9%, suggesting that the financial benefit of early endoscopy can only be realized if physicians use the results of endoscopy in making management decisions.

Thus, both studies suggest that early endoscopy in patients who are hemodynamically stable and have no serious comorbidities can potentially result in lower costs by allowing early discharge in up to ~40–45% of patients, supporting performance of endoscopy as soon as possible in patients with low-risk clinical features. However, the lack of clinical benefit argues against the need for endoscopy in an emergent setting (e.g., "middle of the night") for low-risk patients. Furthermore, as mentioned earlier, patients with very low risk based on pre-endoscopic assessment (e.g., Blatchford score of 0) may be considered for discharge from the emergency department without undergoing endoscopy.

Second-Look Endoscopy

The expense of second-look endoscopy also must be considered. A large number of unnecessary endoscopies will be performed since most patients do not have recurrent bleeding. In addition, second-look endoscopies do not prevent further bleeding in all patients, and repeat endoscopic therapy is successful in most patients with rebleeding. An economic analysis suggests that intravenous proton pump inhibitor (PPI) therapy would be the dominant strategy as compared with second-look endoscopy if the PPI therapy reduced rebleeding to 9% or if it cost \$10 per day. Recent randomized trials report rebleeding rates <9% in patients with high-risk ulcer bleeding treated with endoscopic and PPI therapy. Furthermore, intensive PPI therapy is considered as standard therapy after endoscopic therapy of high-risk stigmata of recent hemorrhage (SRH) and would be employed even if second-look endoscopy is done.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

In an effort to make new guidelines as "fresh" as possible when published, the American College of Gastroenterology (ACG) created a special guideline review process, involving members of the Board of Trustees, Practice Parameters Committee and the American Journal of Gastroenterology. It is the goal to review the guideline, allow guideline authors to revise the guideline, and re-review the guideline within 6 months of first submission. Therefore the entire process should take 1 year from commission to finished, accepted guideline.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate management of patients with overt upper gastrointestinal bleeding (UGIB) due to gastric or duodenal ulcers

Potential Harms

Risk of Early Endoscopy

The potential risk of endoscopy, often performed during off hours in sick patients, must be considered. A prospective, non-randomized study indicated an increased risk of oxygen desaturation in patients undergoing endoscopy within 2 h as compared with endoscopy at 2 to 24 h. This study highlights the fact that early endoscopy has the potential to further increase complications if performed too early, before appropriate resuscitation and stabilization.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Clinical Algorithm

Patient Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Timeliness

Identifying Information and Availability

Bibliographic Source(s)

Laine L, Jensen DM. Management of patients with ulcer bleeding. *Am J Gastroenterol*. 2012 Mar;107(3):345-60. [133 references] [PubMed](#)

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Mar

Guideline Developer(s)

American College of Gastroenterology - Medical Specialty Society

Source(s) of Funding

American College of Gastroenterology

Guideline Committee

Not stated

Composition of Group That Authored the Guideline

Authors: Loren Laine, MD; Dennis M. Jensen, MD

Financial Disclosures/Conflicts of Interest

Potential Competing Interests

Loren Laine has served as a consultant for AstraZeneca, Eisai, Pfizer, Horizon, and Logical Therapeutics, and has served on Data Safety Monitoring Boards for Bayer, BMS, and Merck. Dennis Jensen is a consultant for AstraZeneca, Boston Scientific, Merck, and US Endoscopy. Dennis Jensen has received research grants from Boston Scientific, Pentax, Olympus, US Endoscopy, and Vascular Technology Inc.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [American College of Gastroenterology Web site](#) .

Availability of Companion Documents

The following is available:

- American College of Gastroenterology Practice Parameters Committee. Guideline development policies. 2010 Jan. Available from the [American College of Gastroenterology \(ACG\) Web site](#) .

Patient Resources

The following are available:

- Ulcers and gastrointestinal bleeding: protecting your health. Patient education brochure. Available in Portable Document Format (PDF) from the [American College of Gastroenterology \(ACG\) Web site](#) .
- Understanding ulcers, NSAIDs & GI bleeding – a consumer health guide. Patient education brochure. Available in PDF from the [ACG Web site](#) .

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NGC Status

This NGC summary was completed by ECRI Institute on October 3, 2012. This summary was updated by ECRI Institute on September 18, 2015 following the U.S. Food and Drug Administration advisory on non-aspirin nonsteroidal anti-inflammatory drugs (NSAIDs).

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